Museum, Forest Hill, S.E., at 3.30 p.m. on Saturday afternoons, commencing on January 30, upon the following subjects:—Lightning and the thunderbolt in folk-lore, Mr. E. Lovett; From the ancient herbalist to the modern botanist, Dr. E. Marion Delf; The history and associations of the art of spinning by hand, Mr. W. Dale; The history of writing, Mr. A. R. Wright; Children's toys: their origin and folk-lore, Mr. E. Lovett. Particulars of further lectures will be announced later.

AT the end of last month the Merchant Venturers' Technical College, Bristol, published a preliminary list of present and former members of the College who are at present serving with the Army or Navy, and who have volunteered for service; 362 names were included, but since the list was printed additional names have been received daily, and the total now amounts to 416. Among those whose names appear in the list, there are 26 naval officers and 36 officers holding commissions in the Army. Perhaps the best known name amongst the former students who appear in the list is that of Squadron Commander E. F. Briggs, who received his engineering training in the College, commanded the aerial raid on the Zeppelin factory at Friedrichshafen, and was wounded and captured there in November last.

WE have received a copy of the first issue of a new American educational periodical entitled *School and Society*. It is to be a weekly magazine, and will follow the general lines that are familiar to us in this country in our contemporary *Science*. The paper will be conducted by the editor of *Science*, Prof. J. McKeen Cattell, professor of psychology in Columbia University, and is intended chiefly for teachers in the lower and higher schools of the United States. Among the contributors to the first issue are Dr. Eliot, president emeritus of Harvard University, and Prof. G. Stanley Hall. We commend the new publication to students of education as likely to provide authoritative information about educational effort in the United States in an interesting and attractive form. The magazine is published by the Science Press of New York City, and each number costs 10 cents.

A BEQUEST of 600,000*l*. to Oberlin College by Dr. C. M. Hall, the distinguished electrochemist and manufacturer of aluminium, is announced in the issue of *Science* for January 15. The bequest is in the form of 400,000*l*. endowment to be used for any purpose, 100,000*l*. to be used to build an auditorium, 20,000*l*. for the auditorium's maintenance, and 40,000*l*. to be spent for improvements to the grounds. The college receives in addition all property in Oberlin owned by Dr. Hall, and a valuable art collection. From the same source we learn that by the will of Miss Grace H. Dodge, for many years known for her educational and philanthropic activities in New York City, contains bequests of 280,000*l*. for educational and charitable purposes, as well as a number of deferred bequests of the same character. The sum of 100,000*l*. is bequeathed to Teachers College, Columbia University, in the founding and conduct of which she took an active part. The college will receive two deferred bequests, one of which may be large.

THE fifth report of the Royal Commission on the Civil Service (Cd. 7748) is concerned with the Diplomatic Service (including the Foreign Office) and the Consular Service. Among the recommendations of the Commissioners made in connection with the Diplomatic Corps and the Foreign Office, are the following:—The existing property qualification for admission to the Diplomatic Corps (*i.e.* the possession of a private income of at least 400*l*. a year) should be abolished. The Board of Selection, which interviews applicants for the diplomatic establishment of the Foreign Office and for the Diplomatic Corps, and upon the reports of which nominations to sit at the examination are granted by the Secretary of State, should be reconstructed on a broader basis, and should include a non-official member. The existing requirement that applicants for the diplomatic establishment of the Foreign Office and for the Diplomatic Corps should first obtain the permission of the Secretary of State to appear before the Board of Selection should be removed. All applications should be laid directly before the Board of Selection. The entrance examination for the Foreign Service (*i.e.* the diplomatic establishment of the Foreign Office and the Diplomatic Corps) should be the combined examination for the administrative grades of the General Civil Service (Class I.) A small Departmental Committee should be appointed with a view of providing for the better training of junior members of the Diplomatic Corps, the reduction of its numbers, the devolution of routine work, and the improvement of office methods abroad. In connection with the Consular Service, it is recommended that recruitment should be by open competition in all branches of the Consular Service. The principle should be adopted of taking young men at an age corresponding to a definite stage in the educational system of the country, and then training them for their work. On passing out of training, probationers should be appointed to the grade of Consular Assistant, and placed under the charge of a selected Consul at an important station to learn practical work.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 21.—Sir William Crookes, president, in the chair.—Dr. C. **Chree**: Atmospheric electricity potential gradient at Kew Observatory, 1898–1912. A previous paper discussed results obtained from the Kelvin water-dropping electrograph at Kew Observatory for the period 1898–1904. The present paper discusses the data from the fifteen years 1898–1912. Particular attention is given to the character of the diurnal variation, as to how it varies throughout the year, and as to the nature of the differences apparent between different years. The predominance of the 12-hour term over the 24-hour term in the diurnal variation, which is especially conspicuous in summer, is found to vary greatly from year to year. The 12-hour term shows less fluctuations either in amplitude or phase than the 24-hour term.—Prof. A. E. H. **Love**: The transmission of electric waves over the surface of the earth.—An analytical solution of the general equations of electrodynamics is obtained for the case of waves generated by a vibrating doublet in presence of a conducting sphere, and is adapted to obtain the known solution for perfect conduction, and the correction for moderate resistance, such as that of sea-water. The known solution is expressed by the sum of a series involving zonal harmonics, and the correction by a similar series. Different results have been obtained by different writers who have investigated the numerical value of the former sum. In the paper a new method of summing the series is explained, and worked out in detail for the wave-length 5 km. In the case of perfect conduction the result confirms that found by H. M. Macdonald (Proc. Roy. Soc., Ser. A, vol xc., 1914, p. 50). The effect of resistance is found to be a slight increase of the strength of the signals at considerable distances, counteracting to some small extent the enfeebling effect of the curvature of the surface.—L. **Silberstein**: Electromagnetic waves in a perfectly conducting tube. The problem of waves in conducting tubes, which has already been treated by various authors, is here taken up with the purpose of developing some of its solutions which offer noteworthy peculiarities with respect to the velocity of the corresponding waves. The waves investigated are axially symmetrical and of permanent type. Their velocity of transfer along the tube is a comparatively simple function of the period of vibration and of the "order" of waves, and it exceeds, for each of these waves, the velocity of light in free space. The peculiarities of distribution of the lines of force are illustrated by two examples with annexed drawings. The paper closes with remarks concerning superpositions of waves of the specified kind, more especially of electromagnetic pulses.—H. B. **Keene**: An electrically-heated full radiator. The essential conditions in a determination of the constant of the Stefan-Boltzmann law of radiation are, either that both "emitter" and "receiver" are full radiators, or that the amount by which they fall short of full radiators is known—an amount difficult to determine with certainty. Hitherto, a measurement of this constant has not been made under full radiation conditions. This paper describes an electrically-heated "constant temperature enclosure" which has been constructed for temperatures in the neighbourhood of 1100° C. It consists of a hollow cylinder of alumina, about 8 in. in diameter, closed with conical end pieces of the same material. Three separate windings of platinum strip provide a means of adjusting the temperature distribution within the enclosure, which can be made uniform to within two or three degrees. At the apex of one of the cones is a circular aperture which emits radiation closely approximating to full radiation. It is intended to use this radiator in conjunction with a full receiver, described in an earlier paper, in order to determine the value of the radiation constant under "black-body" conditions.

Geological Society, January 6.—Dr. A. Smith Woodward, president, in the chair.—C. I. **Gardiner**: The Silurian inlier of Usk (Monmouthshire). The Usk inlier lies a few miles north of Newport (Mon.). Between the coalfields of South Wales and the Forest of Dean the Old Red Sandstone is bent into an anticline, the axis of which runs very nearly north and south. This has been denuded away to the west of Usk, and Silurian beds have been exposed, the rocks seen being of Ludlow and Wenlock age. In the southern part of the inlier the Silurian rocks are arranged in two anticlinal folds, the axes of which run nearly north and south and dip southwards. These folds are separated by a fault. The Old Red Sandstone is believed to rest unconformably on the Ludlow Beds along much of the margin of the Coed-y-paen anticline, and beneath the Ludlow beds, which are about 1300 ft. thick, come 35 to 40 ft. of a Wenlock Limestone, which covers Wenlock Shales: of these latter some 850 ft. are seen. At their base the Ludlow Beds seem to pass conformably down into the Wenlock Beds, and the Wenlock Limestone is probably not at the summit of the Wenlock Shales. The Wenlock Limestone occurs either in irregular layers separated by sandy shales, or in massive beds largely made up of crinoid fragments.—S. R. **Haselhurst**: some observations on cone-in-cone structure and their relation to its origin. In a brief review our state of knowledge is summarised, and the deductions of other investigators are analysed. The author critically examines the accepted hypothesis that cone-in-cone structure is something essentially due to crystallisation. He describes the results of some high-pressure mimetic experiments. These experiments were designed to produce this structure, and reveal what the author believes to be many new points on the origin of concretions and cone-in-cone in particular. The experiments are new, inasmuch as the media used, namely: brittle, semi-plastic, and plastic, are enclosed in tunics of varied design, and then subjected either to a high uniform hydrostatic pressure or to a direct thrust. The author concludes from the evidence:—(1) That cone-in-cone is not due to crystallisation, but is a mechanically produced structure due to great and localised pressure; (2) that it is closely allied to the phenomenon known as pressure solution; (3) that cone-in-cone structure is closely associated with other rock-structures which are mutually indicative the one of the other, and also of their mode of origin.

EDINBURGH.

Royal Society, December 21, 1914.—Sir Thomas Fraser, vice-president, in the chair.—Sir Thomas **Fraser**: The poisoned arrows of the Abors and Mishmis of north-east India, and the composition and action of their poisons. A large collection of arrows, bows, and quivers had been received from time to time from medical and military officers of the Indian Army, and it was soon apparent that different poisons were used in different groups. In one group, chiefly used by the Mishmis, the action of the poison suggested aconite as the active agent. In another group, used by the Abors, the arrows yielded, on extraction with ether, an oil with the physical characters of the oil of *Croton tiglium*. This oil could not produce death in warm-blooded animals, but was lethal to frogs. The poison on the aconite arrows varied greatly in power. If the whole of the poison of one arrow were absorbed, a most improbable possibility, the most active arrows carried enough to kill three men.—J. Herbert **Paul**: Regeneration of the legs of Decapods from the preformed breaking planes. When a lobster, hermit crab, or shore crab loses a limb, a small limb bud forms as the first stage in the process of regeneration. When the animal moults, this bud rapidly expands to the size of the true complete limb, becomes covered with a hard calcified layer like the rest of the integument, and gains full functional power in a few days. The paper contained a detailed account of the manner in which the various stages of regeneration were effected. When the old limb is lost the valvular action of the diaphragm at the breaking plane prevents hæmorrhage; and in the regenerative process a new diaphragm is the first structure laid down.—Prof. Alex. **Smith** and R. H. **Lombard**: The degrees of dissociation in the saturated vapours of the ammonium haloids. The paper was concerned with the densities and degrees of dissociation of the chloride, bromide, and iodide of ammonium. In the chloride the degree of dissociation was nearly constant within the range of temperatures from 280° to 330°; in the bromide it reached a maximum about 320°, and diminished steadily up to 388°; and in the iodide it was practically zero. There was evidence in the last case of association above 340°. The results for the bromide showed that, about 320°, the heat of dissociation was positive. This seemed to be the first observation of a positive heat of dissociation in the gaseous state.

PARIS.

Academy of Sciences, January 11.—M. Ed. Perrier in the chair.—L. **Lecornu**: The deformation of cylindrical tubes.—André **Blondel**: Calculation of the range of optical projectors both on land and sea. A formula is deduced in which certain constants can only be determined experimentally, and suggestions are made as to the best means of determining these constants. — Edouard **Heckel**: *Solanum Caldasii*

Kunth (*S. guaraniticum,* Hassler) from the systematic point of view. *S. Caldasii* and *S. etuberosum* have been regarded by Berthault as identical species. The author points out their differences, and states that the only point they have in common is the fact that they both occur in Chili.—F. **Bompiani**: The geometry of Laplace's equation.—J. **Cabannes**: The diffusion of light by air. A beam of light from a quartz mercury lamp was examined at right angles to the path of the beam, and measurements made both optically and photographically of the intensity of the diffused light. No diffusion occurs when the beam is in a vacuum, and Lord Rayleigh's diffusion formula was quantitatively confirmed.—L. **Gay**: The expansibility product.—Œchsner de **Coninck**: The molecular weight of the oxybenzoic acids. The method is based on the determination of the calcium in the calcium oxybenzoates, these being obtainable in a state of high purity.—J. **Repelin**: The prolongation towards the east of the Senonian synclinal of the Plan d'Aups, Saint-Baume.—Jean **Chautaud**: The origin of the petroliferous mounds of Texas and Louisiana. Contribution to the study of the origin of petroleum. The hypotheses put forward to account for the formation of these mounds are not in accord with the geological structure of the region. These hypotheses are criticised in detail, and it is shown that the mounds have an origin which is independent of orogenic or eruptive actions. The processes of formation suggested by the author are sedimentation in an intermittent lagoon, followed by a hydrocarbon decomposition of the organic *débris,* the transformation of the anhydrite into gypsum, with resulting compression and the migration of the petroleum under the influence of the pressure exerted on the mother rocks.—N. **Arabu**: Studies on the Tertiary formations of the basin of the Sea of Marmora. The Vindobonian in Thrace.—A. **Boutaric**: The polarisation and absorptive power of the atmosphere. Observations carried on during three years confirm the views of K. Ångström that the absorptive power of the atmosphere should depend on the diffusion and quantity of the absorptive gas present, mainly water vapour. The main factor is shown to be the diffusion. From observations of calorific intensity, polarisation, and hygrometric state carried out at a given station for some years, it is possible to predict the calorific intensity at different times on a given day from measurements of the polarisation and hygrometric state, or even from a simple polarimetric observation alone.—A. **Goris** and Ch. **Vischniac**: Tormentol, a principle extracted from *Potentilla tormentilla.* The substance is crystalline, contains no nitrogen, and has the composition $C_{33}H_{50}O_{10}$. Its constitution has not been completely worked out, but it is an ether-alcohol.—F. **Bordas**: A new arrangement for the disinfection of clothing. A description of an apparatus, easily put together, capable of disinfecting with steam at a temperature of 105° to 108° the clothes of five hundred men per hour.—Victor **Henri**: The possibility of phosphorus being carried into wounds produced by the projectiles of the German artillery (see p. 598).—W. R. **Thompson**: An intracuticular parasite of *Hamemalis virginiana.*

January 18.—M. Ed. Perrier in the chair.—Maurice **Hamy**: The exact determination of the collimation of non-reversible meridian telescopes. It is shown that the usual method of adjustment with two collimators may be affected by a systematic error and the substitution of two plane parallel mirrors is suggested, their diameter being at least equal to that of the objective of the instrument. Such mirrors can now be made with high precision, and a method of adjusting them to exact parallelism is given.—M. **Guichard**: Surfaces such that the centres of the spheres osculating the lines of curvature of a series, shall be a paraboloid of revolution.—F. **Gonessiat**: Results of the observations of two occultations of the Pleiades by the Moon. Details of observations made at Algiers on September 20 and December 11, 1914.—B. **Jekhowsky**: Observations of Delevan's comet, 1913*f*, made at the Observatory of Paris, with the equatorial in the western tower of 30·5 cm. aperture. Positions are given for December 18, 24, 26, 28, and 29, both of the comet and the comparison stars. On December 29 the comet appeared as a rounded nebulosity 40 seconds diameter with a nearly stellar nucleus of 6·5 magnitude.—G. A. **Miller**: Sylow's theorem.—Foveau de **Courmelles**: Determination of the position of projectiles in the human body by radioscopy. Two methods based on the use of a fluorescent screen are described.—J. **Bougault** and Mlle. R. **Hemmerlé**: The tautomerism of phenylpyruvic acid. In a previous communication J. Bougault suggested that phenylpyruvic acid might exist in two tautomeric forms, enolic and ketonic. Further proofs of this isomerism are now given, based on the differences in reactivity of the acid and its alkali salts towards acetic acid, potassium permanganate, and semicarbazide. The free acid has the enolic form, $C_6H_5.CH:C(OH).CO_2H_1$, the neutral salts being ketonic, $C_6H_5.CH_2.CO.CO_2M$. The conditions for passing from the one form to the other have been studied.—Ch. J. **Gravier**: A phenomenon of multiplication by longitudinal scission in a Madrepore, *Schizocyathus fissilis.*—Alfred **Angot**: Value of the magnetic elements at the Val-Joyeux Observatory to January 1, 1915.—Alfred **Angot**: The earthquake of January 13, 1915. From the records of the seismograph at Parc Saint-Maur; the position of the epicentre was easily fixed at about 1300 kilometres S.E., that is, in Italy. The displacement was much less than that caused by the earthquake in Russian Turkestan on January 3, 1911.—J. **Danysz**: The treatment of wounds by solutions of nitrate of silver of strengths 1 in 200,000 to 1 in 500,000. A demonstration of the advantages of using certain antiseptic substances, especially silver nitrate, in very dilute solution.

BOOKS RECEIVED.

Smithsonian Miscellaneous Collections. Vol. lxii., No. 6. Smithsonian Physical Tables. Prepared by F. E. Fowle. Sixth revised edition. Pp. xxxvi+355. (Washington: Smithsonian Institution.)

Egyptian Government. Almanac for the Year 1915. Pp. viii+250. (Cairo: Government Press.) P.T.5.

The South African Institute for Medical Research. Anthropological Notes on Bantu Natives from Portuguese East Africa. By G. D. Maynard and G. A. Turner. Pp. 35. (Johannesburg: South African Institute for Medical Research.) 2*s.* 6*d.*

The Case-Hardening of Steel. By H. Brearley. Pp. xv+169. (London: Iliffe and Sons, Ltd.) 7*s.* 6*d.*

African Adventure Stories. By J. A. Loring. Pp. x+301. (London: G. Allen and Unwin, Ltd.) 6*s.* net.

The History of Melanesian Society. By W. H. R. Rivers. Vol. i. Pp. xii+400. Vol. ii. Pp. 610. (Cambridge University Press.) 2 vols. 36*s.* net.

Macmillan's Geographical Exercise Books. iii. The British Isles, with Questions by B. C. Wallis. Pp. 48. (London: Macmillan and Co., Ltd.) 6*d.*

A Shilling Arithmetic. By W. M. Baker and A. A. Bourne. Pp. xiv+192. (London: G. Bell and Sons, Ltd.) 1*s.*